



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,372	06/01/2001	Mitchell T. Berg	130142	2815
52531 7590 03/25/2008 CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC 1420 FIFTH AVENUE SUITE 2800 SEATTLE, WA 98101-2347				
EXAMINER				
NEURAUTER, GEORGE C				
ART UNIT		PAPER NUMBER		
2143				
MAIL DATE		DELIVERY MODE		
03/25/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/872,372

Applicant(s)

BERG, MITCHELL T.

Examiner

George C. Neurauter, Jr.

Art Unit

2143

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58 and 60-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58 and 60-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/20/07, 1/24/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58, and 60-68 are currently presented and have been examined.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 December 2007 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58, and 60-68 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58, and 60-68 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58, and 60-68 recites various limitations that are done in "a manner transparent to the client".

An objective standard for determining compliance with the written description requirement is, "does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). Under *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991), to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed. See also MPEP 2163.02.

The manner in which any such functions are transparent to the client was not described in the specification with reasonable clarity in order for one skilled in the art to recognize that the Applicant had possession of the claimed invention and to recognize with the Applicant has claimed. There is no disclosure within the specification of any sort regarding "transparency" in relation to the client's perspective and/or from any other perspective and/or how such transparency is achieved. Therefore, the claims fail to comply with the written description requirement.

Claims 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58, and 60-68 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1-7, 10-12, 16-22, 25-27, 31-34, 37-43, 46-58, and 60-68 recite performing limitations "in a manner transparent to the client". This subject matter was not described in the specification in order for one skilled in the art to make and/or use any such transparent manner of transferring data as claimed. Therefore, the claims fail to meet the enablement requirement.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1-3, 7, 10-12, 16-18, 22, 25-27, 31-33, 37-42, 46-48, 53-54, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Load Balancing a Cluster of Web Servers Using Distributed Packet Rewriting" to Aversa et al., January 1999, as cited in the IDS filed 1 October 2001 in view of "TCP Connection Migration" to Snoeren et al.

Regarding claim 1, Aversa discloses an information processing system, comprising a first computing device ("server") configured to receive an initialization packet ("SYN packet") originating from a client and selecting a computing device to service the client wherein the first computing device may or may not be selected to service the client (page 3, specifically "DPR is an IP level mechanism that equips a server with the ability to redirect an incoming connection to a different server in the cluster based on the very first packets (SYN packet) received from the client."; page 4, specifically "Such requests can be either served locally or re-routed to another machine.").

Aversa does not expressly disclose storing an unbound data structure associated with a connection to the client, however, this limitation is inherent in the context of TCP connections disclosed in Aversa as demonstrated in the Applicant's admitted prior art ("AAPA") and the "Transmission Control Protocol" specification ("TCP"). Page 8, lines 1-14 of the specification discloses that "conventionally" after accepting a TCP connection from a requesting client, a server creates a data structure associated with the connection with the client to "store client-to-server protocol specific connection information". "TCP" also discloses this in section 2.7 of the specification, specifically

regarding the storing of a data structure associated with a connection to a client or "Transmission Control Block". This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Aversa continues to disclose that when the first computing device is selected to service the client, bind the unbound data structure associated with a connection to the client to an application of the first computing device (page 4, specifically "Such requests can either served locally...").

These limitations are also inherent as demonstrated by the "Transmission Control Protocol" specification ("TCP"). Section 1.5, subsections "Multiplexing" and "Connections", section 2.7, and section 3.2 of "TCP" discloses that, during the opening of a TCP connection, a socket and its associated application of a server or "first computing device" are associated with a created data structure associated with a connection to the client or "Transmission Control Block". This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Aversa does not expressly disclose that when the first computing device is not selected to service the client, migrate the unbound data structure associated with the connection to the selected computing device in a manner transparent to the client.

Snoeren discloses in the context of selection of computing devices for servicing clients without involvement of the client (page 2, specifically "The TCP migration options are motivated by the desire for a TCP that can work across changes in name-to-address mappings, e.g., due to...server-to-server migration of one end-point of a connection for...load-balancing reasons."), the data structure associated with the connection is migrated to the selected computing device (page 5, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular, establishment of the second connection terminates the first, and transfers the original TCB to the second connection...")

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Snoeren discloses that the motivation for migrating the data structure associated with a connection to a client so that connections can be transferred to another computing device for the purposes of load balancing (page 2,

specifically "The TCP migration options are motivated by the desire for a TCP that can work across changes in name-to-address mappings, e.g., due to...server-to-server migration of one end-point of a connection for...load-balancing reasons."). In view of these specific advantages and that the references are directed to managing client connections to computing devices, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor, which would lead one of ordinary skill to reasonably expect a successful combination of the teachings.

Regarding claim 2, Aversa and Snoeren disclose the system of claim 1.

Aversa does not expressly disclose wherein the unbound data structure includes a group of sequence numbers associated with the connection, however, this limitation is inherent in the context of TCP connections disclosed in Aversa as demonstrated in the Applicant's admitted prior art ("AAPA") and the "Transmission Control Protocol" specification ("TCP"). AAPA discloses on page 8, lines 20-23, that a data structure that includes a group of sequence numbers which is "conventionally" created by a server after accepting a TCP connection from a

requesting client. Section 3.2 of "TCP" similarly discloses the data structure or "Transmission Control Block" or "TCB" including such a group of sequence numbers. This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Regarding claim 3, Aversa and Snoeren disclose the system of claim 1.

Aversa does not expressly disclose wherein the bound data structure includes an IP address of the client, a port of an application executed by the client, an IP address of the first computing device, and a port of the application executed by the first computing device, however, this limitation is inherent in the context of TCP connections disclosed in Aversa as demonstrated in the Applicant's admitted prior art ("AAPA") and the "Transmission Control Protocol" specification ("TCP"). AAPA discloses on page 8, lines 15-19, that a data structure that includes an IP address of the client, a port of an application executed by the client, an IP address of the first computing device, and a port of the application executed by the first computing device which is "conventionally" created by a server after accepting a TCP connection from a requesting client.

Section 3.2 of "TCP" similarly discloses the data structure or "Transmission Control Block" or "TCB" including such a group of sequence numbers. This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Regarding claim 7, Aversa and Snoeren discloses the information processing system of claim 1.

Aversa does not expressly disclose wherein in response to at least the initialization packet the first computing device is configured to generate an acknowledgement to the client, however, this limitation is inherent in the context of TCP connections disclosed in Aversa as demonstrated in the "Transmission Control Protocol" specification ("TCP"). Sections 3.2 and 3.3 of "TCP" disclose wherein in response to at least the initialization or "SYN" packet the first computing device is configured to generate an acknowledgement or "ACK" to the client. This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Regarding claim 10, Aversa discloses an information processing system comprising a first computing device configured

to associate an application of the first computing device with a data structure associated with a connection to a client. (page 4, specifically "Such requests can either served locally...").

These limitations are also inherent as demonstrated by the "Transmission Control Protocol" specification ("TCP"). Section 1.5, subsections "Multiplexing" and "Connections", section 2.7, and section 3.2 of "TCP" discloses that, during the opening of a TCP connection, a socket and its associated application of a server or "first computing device" are associated with a created data structure associated with a connection to the client or "Transmission Control Block". This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Aversa does not expressly disclose selectively disassociating the application of the first computing device from the data structure and subsequently outputting a reference to the data structure associated with the connection in a manner transparent to the client, however, Snoeren does disclose these limitations (see at least page 5, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular, establishment of the second connection terminates

the first, and transfers the original TCB to the second connection...").

Claim 10 is rejected since the motivations regarding the obviousness of claim 1 also apply to claim 10.

Claims 11 and 12 are also rejected since these claims recite substantially the same limitations as recited in claims 2 and 3 respectively.

Claims 16-18 and 22 are also rejected since these claims recite a method that contain substantially the same limitations as recited in claims 1-3 and 7 respectively.

Claims 25-27 are also rejected since these claims recite a method that contain substantially the same limitations as recited in claims 10-12 respectively.

Regarding claim 31, Aversa and Snoeren disclose the system of claim 1.

Aversa does not expressly disclose wherein the unbound data structure comprises a connection endpoint, however, this limitation is inherent in the context of TCP connections disclosed in Aversa as demonstrated in the Applicant's admitted prior art ("AAPA") and the "Transmission Control Protocol" specification ("TCP"). Page 8, lines 1-14 of the specification discloses that "conventionally" after accepting a TCP connection

from a requesting client, a server creates a data structure associated with the connection with the client to "store client-to-server protocol specific connection information". "TCP" also discloses this in section 2.7 of the specification, specifically regarding the storing of a data structure associated with a connection to a client or "Transmission Control Block". This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Regarding claim 32, Aversa and Snoeren disclose the system of claim 1.

Aversa does not expressly disclose wherein the first computing device is configured to migrate the unbound data structure by storing a reference to a second computing device and associating the stored reference with the unbound data structure, however, Snoeren does disclose these limitations (pages 5 and 6, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular, establishment of the second connection terminates the first, and transfers the original TCB to the second connection...In practice, this is often implemented by simply modifying the TCB

of the first connection rather than allocating an entirely new one.").

Claim 32 is rejected since the motivations regarding the obviousness of claim 1 also applies to claim 32.

Regarding claim 33, Aversa and Snoeren disclose the system of claim 1.

Aversa discloses wherein the first computing device is configured to select the computing device to service the client based at least in part on a state of the first computing device. (page 5, specifically "When a new request (i.e. the SYN packet of a TCP connection) is received by Server 4 from client B, Server 4 first examines its own load.")

Regarding claim 37, Aversa and Snoeren disclose the system of claim 10.

Aversa does not disclose wherein the reference is output to a second computing device for associating an application of the second computing device with the data structure of the connection, however, Snoeren does disclose these limitations (page 5, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular, establishment of the second connection terminates the first, and transfers the original TCB to the second connection...").

Claim 37 is rejected since the motivations regarding the obviousness of claim 1 also apply to claim 37.

Regarding claim 38, Aversa and Snoeren disclose the system of claim 37.

Aversa discloses wherein the application of the first computing device is of a first type and the application of the second computing device is of a second type. (page 4, specifically "Such requests can either be serviced locally or re-routed to another machine. In the latter case, the responsibility of serving the request will be transferred to another machine, which will respond directly to the client")

Regarding claim 39, Aversa and Snoeren disclose the system of claim 37.

Aversa does not expressly disclose wherein the first computing device is configured to selectively disassociate the application of the first computing device from the data structure based at least in part on a state of at least one of the first computing device or the second computing device, however, Aversa does disclose wherein the first computing device is configured to select a second computing device to service the client based at least in part on a state of the first computing device or the second computing device. (page 5, specifically "Hosts intermittently broadcast their load to the other

machines...This information is used by a server to determine whether an incoming request should be re-routed or whether it should be served locally...When a new request (i.e. the SYN packet of a TCP connection) is received by Server 4 from client B, Server 4 first examines its own load.")

Snoeren discloses wherein the first computing device is configured to selectively disassociate the application of the first computing device from the data structure based on the state of the first computing device and the second computing device (page 2, specifically "The TCP migration options are motivated by the desire for a TCP that can work across changes in name-to-address mappings, e.g., due to...server-to-server migration of one end-point of a connection for...load-balancing reasons."; page 5, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular, establishment of the second connection terminates the first, and transfers the original TCB to the second connection...")

Claim 39 is rejected since the motivations regarding the obviousness of claim 1 also apply to claim 39.

Claims 40-42 and 46-48 are also rejected since these claims recite substantially the same limitations as recited in claims 31-33 and 37-39 respectively.

Claim 53 is rejected since this claim recites substantially the same limitations as recited in claims 10 and 37 in combination and is subject to the same rationale as shown above regarding claim 1.

Claim 54 is rejected since this claim recites substantially the same limitations as recited in claim 11.

Regarding claim 57, Aversa and Snoeren disclose a computer-readable memory medium of claim 53.

Aversa and Snoeren do not expressly disclose re-associating the application of the first server to the data structure associated with the connection to the client, however, Snoeren does suggest that in the context of load balancing it may be preferable to associate a connection with a new server (page 2, specifically "The TCP migration options are motivated by the desire for a TCP that can work across changes in name-to-address mappings, e.g., due to...server-to-server migration of one end-point of a connection for...load-balancing reasons."; page 5, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular,

establishment of the second connection terminates the first, and transfers the original TCB to the second connection..."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Aversa and Snoeren to re-associate the application of the first server to the data structure associated with the connection to the client because one of ordinary skill, given the suggestion within Snoeren that, in order to keep loads balanced between at least two servers, it would be preferable to migrate the connection to another server. Also, Aversa discloses the ability of servers to determine the load of other servers based on messages sent to each server and that this information is used to determine whether a server should select a different server to serve a connection (page 5, specifically "Hosts intermittently broadcast their load to the other machines...This information is used by a server to determine whether an incoming request should be re-routed or whether it should be served locally). Therefore, it would have been reasonably suggested to one of ordinary skill in the art by the suggestions of Snoeren and Aversa that it would be possible for a connection to be re-associated with the first server in the event that the load on the second server becomes too high and the first server's load is now able handle the connection. Therefore, this limitation

would have been obvious to one of ordinary skill since the teachings and suggestions of Aversa and Snoeren reasonably suggest this limitation.

2. Claims 4-6, 19-21, 34, 43, 61 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aversa in view of US Patent 6,334,153 to Boucher et al.

Regarding claim 4, Aversa discloses an information processing system, comprising a first computing device configured to receive a request packet originating from a client and when the packet is associated with a connection that corresponds to an application of the first computing device, forward the packet to a network protocol stack of the first computing device and when the packet is not associated with a connection that corresponds to an application of the first computing device, selectively encapsulate the packet and forward the encapsulated packet to a second computing device in a manner transparent to the client. (page 3, specifically "...a DPR-enabled server either forwards a connection to a different server, or lets it percolate up its network stack..."; page 4, specifically "Such requests can be either served locally or re-routed to another machine."; page 4 and 5, specifically "if Server 4 reroutes a request to Server 2, the Server 4 must let Server 2 know Client's B's IP address in order for Server 2 to

respond to Client B's request properly...Using IP-IP encapsulation, Server 4 encapsulates the original packet received from client B inside another IP packet, which is then re-routed to Server 2.")

Aversa does not expressly disclose forwarding the packet and a reference to an associated connection endpoint wherein the encapsulated packet includes a reference to a connection endpoint associated with the packet to a network protocol stack of the first computing device that is external to an operating system of the first computing device, however, Boucher does disclose forwarding the packet and a reference to an associated connection endpoint ("communication control block") to a network protocol stack of the first computing device that is external to an operating system of the first computing device ("fast path") (column 3, line 40-column 4, line 10, specifically column 3, line 62-column 4, line 6; column 5, lines 41-54)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Boucher discloses that forwarding a packet a reference to an associated connection endpoint to a network protocol stack external to an operating system of the first device allows the network protocol stack external to the operating system to bypass conventional protocol processing by

the conventional network stack within the operating system to accelerate processing of packet headers (column 3, line 62-column 4, line 6). In view of these specific advantages and that the references are directed to processing by network protocol stacks of packets, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor, which would lead one of ordinary skill to reasonably expect a successful combination of the teachings.

Claims 5-6 are also rejected since these claims recite substantially the same limitations as recited in claims 2 and 3 respectively.

Claims 19-21 are also rejected since these claims recite a method that contains substantially the same limitations as recited in claims 4-6 respectively.

Regarding claim 34, Aversa and Boucher disclose the system of claim 4.

Aversa discloses wherein the application of the first computing device is a socket-based application (page 4, specifically "Such requests can either served locally...").

This limitation is also inherent as demonstrated by the "Transmission Control Protocol" specification ("TCP"). Section

1.5, subsections "Multiplexing" and "Connections", section 2.7, and section 3.2 of "TCP" discloses that, during the opening of a TCP connection, a socket and its associated application of a server or "first computing device" are associated with a created data structure associated with a connection to the client or "Transmission Control Block". This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Claim 43 is also rejected since this claim recites substantially the same limitations as recited in claim 34.

Regarding claim 61, Aversa and Boucher disclosed the information processing system of claim 4.

Aversa did not expressly disclose wherein the first computing device is an intelligent network interface controller, however, Boucher did disclose this limitation (see at least column 9, line 30-column 10, line 27).

Claim 61 is rejected since the motivations regarding the combination of the references as applied in claim 4 also apply to claim 61.

Claim 64 is also rejected since claim 64 recites a method that contains substantially the same limitations as recited in claim 61.

3. Claims 36, 45, 49-52, 55-56, 58, 66, and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aversa and Boucher as applied to claim 4 above, and further in view of Snoeren.

Regarding claim 36, Aversa and Boucher disclose the system of claim 4.

Aversa and Boucher do not disclose wherein the encapsulated packet includes a reference to the associated connection endpoint, however, Aversa does disclose the encapsulated packet as described above regarding claim 4.

Snoeren discloses wherein a packet sent to the second computing device includes a reference to a connection endpoint associated with the data packet (page 5, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular, establishment of the second connection terminates the first, and transfers the original TCB to the second connection...").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Snoeren discloses that the motivation for migrating the data structure associated with a connection to

a client so that connections can be transferred to another computing device for the purposes of load balancing (page 2, specifically "The TCP migration options are motivated by the desire for a TCP that can work across changes in name-to-address mappings, e.g., due to...server-to-server migration of one end-point of a connection for...load-balancing reasons."). In view of these specific advantages and that the references are directed to managing and processing client connections to computing devices, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor, which would lead one of ordinary skill to reasonably expect a successful combination of the teachings.

Claim 45 is also rejected since this claim recites substantially the same limitations as recited in claim 36.

Claim 49 is rejected since this claim recites substantially the same limitations as recited in claims 4 and 36 in combination and is subject to the same rationale as shown above regarding claim 36.

Claim 50 is rejected since this claim recites substantially the same limitations as recited in claim 5.

Claim 51 is rejected since this claim recites substantially the same limitations as recited in claim 5 and 36 in combination and is subject to the same rationale as shown above regarding claim 36.

Claim 52 is rejected since this claim recites substantially the same limitations as recited in claim 6.

Claim 55 is rejected since this claim recites substantially the same limitations as recited in claims 11 and 36 in combination and is subject to the same rationale as shown above regarding claim 36.

Claim 56 is rejected since this claim recites substantially the same limitations as recited in claim 12 and 36 in combination and is subject to the same rationale as shown above regarding claim 36.

Regarding claim 58, Aversa discloses a first server ("server") configured to receive an initialization packet ("SYN packet") originating from a client. (page 3, specifically "DPR is an IP level mechanism that equips a server with the ability to redirect an incoming connection to a different server in the cluster based on the very first packets (SYN packet) received from the client."; page 4, specifically "Such requests can be either served locally or re-routed to another machine.")

Aversa does not expressly disclose a memory configured to store a data structure associated with a connection to a client originating an initialization packet, however, this limitation is inherent in the context of TCP connections disclosed in Aversa as demonstrated in the Applicant's admitted prior art ("AAPA") and the "Transmission Control Protocol" specification ("TCP"). Page 8, lines 1-14 of the specification discloses that "conventionally" after accepting a TCP connection from a requesting client, a server creates a data structure associated with the connection with the client to "store client-to-server protocol specific connection information". "TCP" also discloses this in section 2.7 of the specification, specifically regarding the storing of a data structure associated with a connection to a client or "Transmission Control Block". This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Aversa continues to disclose a module configured to selectively bind the data structure associated with a connection to the client to an application of the server (page 4, specifically "Such requests can either served locally...").

These limitations are also inherent as demonstrated by the "Transmission Control Protocol" specification ("TCP"). Section

1.5, subsections "Multiplexing" and "Connections", section 2.7, and section 3.2 of "TCP" discloses that, during the opening of a TCP connection, a socket and its associated application of a server or "first computing device" are associated with a created data structure associated with a connection to the client or "Transmission Control Block". This disclosure shows a basis in fact and/or technical reasoning to reasonably support the determination that the above limitations necessarily flow from the teachings of the applied prior art. See MPEP 2112.

Aversa does not disclose a network protocol stack external to an operating system of the first server, however, Boucher does disclose this limitation ("fast path") (column 3, line 40-column 4, line 10, specifically column 3, line 62-column 4, line 6; column 5, lines 41-54)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Boucher discloses that a network protocol stack external to an operating system of the first server allows the network protocol stack to bypass conventional protocol processing by the conventional network stack within the operating system to accelerate processing of packet headers (column 3, line 62-column 4, line 6). In view of these specific advantages and that the references are directed to processing by

network protocol stacks of packets, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor, which would lead one of ordinary skill to reasonably expect a successful combination of the teachings.

Aversa and Boucher do not expressly disclose that when the first server is not selected to service the client, to migrate the data structure associated with the connection in a manner transparent to the client.

Snoeren discloses in the context of selection of computing devices for servicing clients (page 2, specifically "The TCP migration options are motivated by the desire for a TCP that can work across changes in name-to-address mappings, e.g., due to...server-to-server migration of one end-point of a connection for...load-balancing reasons."), the data structure associated with the connection is migrated to the selected computing device without involving the client (page 5, specifically "Fundamentally, the Migrate options allows corresponding hosts to synchronize two separate TCP connections such that the context is identical. In particular, establishment of the

second connection terminates the first, and transfers the original TCB to the second connection...")

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Snoeren discloses that the motivation for migrating the data structure associated with a connection to a client so that connections can be transferred to another computing device for the purposes of load balancing (page 2, specifically "The TCP migration options are motivated by the desire for a TCP that can work across changes in name-to-address mappings, e.g., due to...server-to-server migration of one end-point of a connection for...load-balancing reasons."). In view of these specific advantages and that the references are directed to managing client connections to computing devices, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor, which would lead one of ordinary skill to reasonably expect a successful combination of the teachings.

Regarding claim 66, Aversa, Boucher and Snoeren disclosed the computer-readable memory medium of claim 49.

Aversa and Snoeren did not expressly disclose wherein the first server comprises an intelligent network interface

controller, and the processor of the first server is a processor of the intelligent network interface controller, however, Boucher did disclose these limitations (see at least column 9, line 30-column 10, line 27)

Claim 66 is rejected since the reasons for obviousness as applied to claim 49 also apply to claim 66.

Regarding claim 68, Aversa, Boucher, and Snoeren disclosed the first server of claim 58.

Aversa and Snoeren did not expressly disclose further comprising an intelligent network interface controller, wherein the intelligent network interface controller comprises the memory, the network protocol stack, and the module, however, Boucher did disclose these limitations (see at least column 9, line 30-column 10, line 27)

Claim 68 is rejected since the reasons for obviousness as applied to claim 58 also apply to claim 68.

Claims 60, 62-63, 65, and 67 rejected under 35 U.S.C. 103(a) as being unpatentable over Aversa and Snoeren as applied to claims 1, 10, 16, 25, and 53 as shown above, and further in view of Boucher.

Regarding claim 60, Aversa and Snoeren disclosed the information processing system of claim 1.

Aversa and Snoeren did not expressly disclose wherein the first computing device is an intelligent network interface controller, however, Boucher did disclose this limitation (see at least column 9, line 30-column 10, line 27)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Boucher discloses that forwarding a packet a reference to an associated connection endpoint to a network protocol stack external to an operating system of the first device allows the network protocol stack external to the operating system to bypass conventional protocol processing by the conventional network stack within the operating system to accelerate processing of packet headers (column 3, line 62-column 4, line 6). In view of these specific advantages and that the references are directed to processing by network protocol stacks of packets, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor, which would lead one of ordinary skill to reasonably expect a successful combination of the teachings.

Claims 62 and 65 are also rejected since claims 62 and 65 recite and information processing system and a method that

contain substantially the same limitations as recited in claim 60.

Regarding claim 63, Aversa and Snoeren disclosed the method of claim 16.

Aversa and Snoeren did not expressly disclose wherein the first server comprises an intelligent network interface controller, the intelligent network interface controller performing the method on behalf of the first server, however, Boucher did disclose these limitations (see at least column 9, line 30-column 10, line 27)

Claim 63 is rejected since the reasons for obviousness as applied to claim 60 also apply to claim 63.

Regarding claim 67, Aversa and Snoeren disclosed the computer-readable memory medium of claim 53.

Aversa and Snoeren did not expressly disclose wherein the first server comprises an intelligent network interface controller, and the processor of the first server is a processor of the intelligent network interface controller, however, Boucher did disclose these limitations (see at least column 9, line 30-column 10, line 27)

Claim 67 is rejected since the reasons for obviousness applied to claim 60 also apply to claim 67.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Neurauter, Jr. whose telephone number is 571-272-3918. The examiner can normally be reached on Monday-Friday 9am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn, can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 2143

/George C. Neurauter, Jr./
Primary Examiner, Art Unit 2143